Best Management Practices for Lead at Outdoor Shooting Ranges

Notice

This manual is intended to provide useful general information to shooting range owners/operators. The United States Environmental Protection Agency (EPA) does not certify or approve ranges, range design or lead management practices. While every effort has been made to provide up-to-date technical information, this manual is not to be used as a substitute for consultation with scientists, engineers, attorneys, and other appropriate professionals who should be called upon to make specific recommendations for individual range design and lead management.

Any variation between applicable regulations and the summaries contained in this guidance document are unintentional, and, in the case of such variations, the requirements of the regulations govern.

This guidance was developed by EPA Region 2 in cooperation with a few states as well as many EPA offices. In addition, EPA, with the assistance of the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) provided all 50 states with an opportunity to review the RCRA regulatory portion of the guidance. At the time of printing, about 40 states had contacted the EPA and given their support and concurrence. EPA is continuing to get the agreement of the remaining states. Therefore, it appears that most, if not all, states will share the same view as to how lead shot is regulated.

Following the steps set forth in this guidance should result in compliance with applicable regulations. EPA does not make any guarantee or assume any liability with respect to the use of any information or recommendations contained in this document.

This guidance does not constitute rulemaking by the EPA and may not be relied on to create a substantive or procedural right or benefit enforceable, at law or in equity, by any person.

Acknowledgements

The USEPA would like to acknowledge the support of:

- The National Rifle Association of America
- The National Shooting Sports Foundation
- The Wildlife Management Institute
- Mark Begley, of the Massachusetts Department of Environmental Protection
- Mr. Dick Peddicord, of Dick Peddicord and Company, Inc.

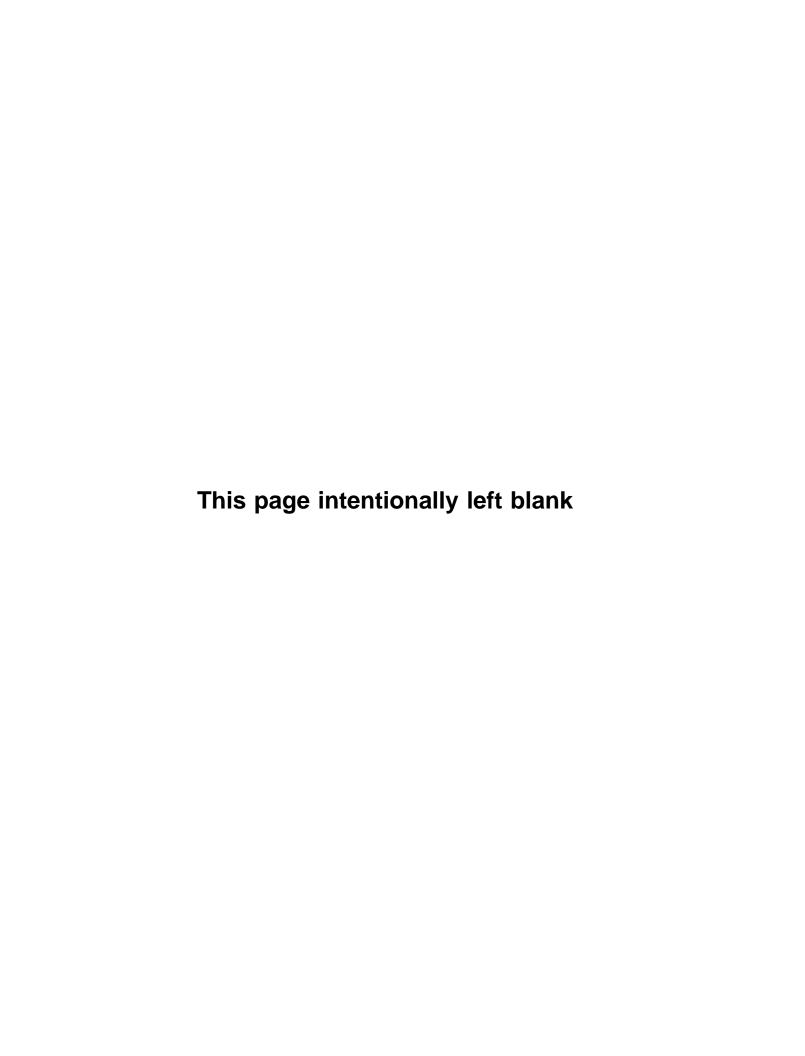
These participants provided valuable information and assistance as peer reviewers in the development of the manual and their efforts are truly appreciated. EPA also wishes to give special thanks to Dr. Charles W. Sever of Okie Environmental Consulting, L.L.C., Inc., Mr. Mike Warminsky of Brice Environmental Services Corp., and Mr. Victor Ordija of Sporting Goods Properties. The EPA also wishes to acknowledge and thank the many others who provided important comments and insight, and especially those individuals who took the time to meet with us in person or on the phone.

Cover photo by: Mr. Jack Hoyt, EPA Region 2

Statement of Goals

The goals of this manual are:

- to inform shooting ranges :
 - that the United States Environmental Protection Agency's (EPA)
 purpose in developing and distributing this manual is to assist range
 owners and operators to operate in an environmentally protective
 manner.
- to promote an understanding of:
 - why lead is an environmental, public and regulatory concern,
 - what laws and regulations apply,
 - the benefits of applying good management practices,
 - what can be done to successfully manage lead,
 - why implementing lead best management practices is an integral part of environmental stewardship,
 - how to minimize litigation risk.
- to promote action by ranges to:
 - adopt and implement best management practices for managing lead,
 - recycle a finite natural resource,
 - become a model for other ranges through proper lead management,
 - advocate environmental stewardship.



Best Management Practices for Lead at Outdoor Shooting Ranges

Table of Contents

	<u>Page</u>
Introduction	V
Chapter I - Environmental and Regulatory Concerns at the Shooting Range	
1.0 Background	
1.1 Impact on Human Health & Environment	
1.2 Legal Requirements & Court Rulings	
1.3 Benefits of Minimizing the Environmental Impact of Lead	I-12
Chapter II - Range Characteristics & Activities to Consider When	
Implementing BMPs	II-1
2.0 Background	II-1
2.1 Physical Characteristics	II-1
2.2 Operational Aspects	II-4
2.3 Planning a New Range	II-4
Chapter III - BMPs for Outdoor Shooting Ranges	III-1
3.0 Background	III-1
3.1 Bullet and Shot Containment Techniques (Step 1)	III-1
3.2 BMPs to Prevent Lead Migration (Step 2)	III-5
3.3 Lead Removal and Recycling (Step 3)	
3.4 Documenting Activities and Record Keeping (Step 4)	III-17
3.5 Additional Economic Considerations	III-18
3.6 Summary of Key BMPs for Rifle and Pistol Ranges	III-18
List of Figures	iii
List of Tables	iv

References

Appendix A - Resources	A-1
Appendix B - Lead Shot Alternatives	B-1
Appendix C - Bullet Containment Diagrams	.C-1
Appendix D - RCRA Regulatory Requirements and Interpretations	.D-1

List of Figures Figure Number <u>Page</u> 1-1 I-5 Effects on the Human Body from Excess Exposure to Lead 2-1 pH Scale II-1 3-1 Four Steps to Build a Successful Lead Management Program Utilizing a Variety of BMPs III-1 3-2 Sample Filter Bed System III-10 Examples of Common Lead Reclamation Equipment III-11 3-3

List of Tables

Table Number		<u>Page</u>
1-1	Application of Key Terms to Outdoor Ranges	I-10
2-1	Common Physical Characteristics at Ranges - Potential Risk and Benefits Associated with Range Operations	II-3
3-1	Summary of Key BMPs for Achieving a Successful Rifle and Pistol Range	III-19
3-2	Calculating Weight of Lime to Increase Soil pH Values	III-6

Introduction

This manual provides owners and operators of outdoor rifle, pistol, trap, skeet and sporting clay ranges with information on lead management at their ranges. This manual serves as a reference guide and presents best management practices (BMPs) available to the shooting range community. The practices have been proven to effectively reduce or eliminate lead contamination and may also be economically beneficial to the range owner/operator. Since each range is unique in both the type of shooting activity and its environmental setting, specific solutions are not provided in this manual. Rather, a range owner or operator may use this manual to identify and select the most appropriate BMP(s) for their facility. Other information on environmental aspects of management at outdoor shooting ranges can be found in the National Shooting Sports Foundations Environmental Aspects of Construction and Management of Outdoor Shooting Ranges.

The manual does not address range layout or design to meet range safety or competition requirements. For information on range safety and competition requirements, range owners/operators are directed to other comprehensive reference materials available on that subject, such as the National Rifle Association Range Source Book, and the National Association of Shooting Range's "Range Info." website (www.rangeinfo.org).

Owners/operators of ranges may want to assign the use of this BMP Manual to a specific team or committee. Delegating this responsibility to a specific team or group helps to assure that the BMP's are identified and implemented.

The manual is organized as follows:

 Chapter I provides the background on why lead is of concern to human health and the environment. It includes a discussion of how environmental laws impact shooting ranges and the importance of an integrated BMP program to manage lead.

- Chapter II discusses physical and operational characteristics to be considered when selecting a successful BMP program.
- Chapter III addresses best management techniques for rifle/pistol ranges, skeet and trap ranges, and sporting clay ranges. In this chapter, the manual explores possible solutions to prevent, reduce and/or remove lead contamination for each type of range.
- The Appendix provides current (as of December 2000) contacts for lead reclamation and recycling companies, vendors that provide prevention and/or remediation techniques and shooting organizations that have additional information on the lead issue.

EPA is very interested in any suggestions you have about practices included in this manual which have proven effective in controlling lead contamination or recycling lead bullets/shots. Please send such information to the address below. Also, for additional information, or to be added to the list of lead reclaimers or remediation contractors, contact the National Rifle Association (NRA), the National Shooting Sports Foundation (NSSF) or:

Lead Shot Coordinator
RCRA Compliance Branch
U.S. Environmental Protection Agency
Region 2
290 Broadway
New York, New York 10007-1866
Telephone: (212)637-4145

E-Mail: Leadshot.Region2@epa.gov

